

## REMARKS

The Examiner is thanked for the careful examination of the application, the indication of allowable subject matter, and the courtesy of the interview granted Applicants' attorney on February 8, 2005.

During the interview, the prior art rejections were discussed, as well as some proposed amendments to the claims. No agreement was reached at the interview.

Claims 20 and 22-27 stand allowed, and claims 1-19 and 30 are rejected. Applicants submit amendments to claims 1 and 10 and newly written claims 31 through 48. Therefore, claims 1-20, 22-27 and 30-48 are the only claims remaining in this application.

Claims 1, 2, 5 and 7 stand rejected under 35 U.S.C. §102 as being anticipated by U.S. Patent No. 6,496,632, hereinafter Borrelli.

In response to that rejection, claim 1 has been amended to recite that the regions of higher refractive index are made of canes and that the region of lower refractive index has a longest transverse dimension which is sufficiently large to provide that light is substantially confined in the lower refractive index region by virtue of a photonic band gap of the cladding material and is guided along the fibre. As discussed at the interview and recognized by the Examiner, Borrelli does not teach or suggest a photonic crystal fibre combination that includes a region of substantially uniform, lower refractive index substantially surrounded by cladding which includes noncoaxial regions of higher refractive index, wherein the regions of higher refractive index are made of canes. In Borrelli, none of the regions are made of canes.

Borrelli also does not teach or suggest the claimed combination wherein the region of lower refractive index has a longest transverse dimension which is sufficiently large to provide that light is substantially confined in the lower refractive index region by virtue of a photonic band gap of the cladding material and is guided along the fibre. This language is discussed at length in the response filed on December 1, 2004, and those remarks are incorporated herein by reference. In

summary, that language is intended to address the Examiner's concern that a functional "whereby" statement does not define structure to which patentable weight should be given. As now amended, the feature is now described with structural recitations that should be considered.

Accordingly, in view of the amendments to claim 1, that claim is now patentable over Borrelli. Claims 2, 5, and 7 depend from claim 1, and are thus also patentable over Borrelli, at least for the reasons set forth above with respect to claim 1.

Claims 3, 4, 6, 8-19, and 30 have been rejected under 35 USC 103(a) as being unpatentable over Borrelli. Claims 3, 4, 6, and 8-9 depend from claim 1, and are thus patentable over Borrelli at least for the reasons set forth above with regard to claim 1.

Claim 10 has also been amended to define the regions of higher refractive index as being made of canes. As set forth above, the Examiner has recognized that Borrelli does not teach or suggest a photonic crystal fibre combination that includes a region of substantially uniform, lower refractive index substantially surrounded by cladding which includes noncoaxial regions of higher refractive index, wherein the regions of higher refractive index are made of canes. Accordingly, claim 10 is also patentable over Borrelli. Claims 11-19 and 30 depend from either claim 1 or claim 10, and are thus also patentable over Borrelli.

The Examiner is thanked for the indication that claims 20 and 22-27 contain allowable subject matter.

To further define the protection to which the applicants are entitled, new claims 31 – 48 are submitted herewith.

New claim 31 defines a photonic crystal fibre comprising a region of substantially uniform, lower refractive index; said lower refractive index region substantially surrounded by cladding which includes non-coaxial regions of higher

refractive index and which is substantially periodic, wherein said region of lower refractive index has a longest transverse dimension of at least 9  $\mu\text{m}$ . At the interview, the Examiner indicated that claim 31 likely distinguished over Borrelli. However, the Examiner wanted to study the issue further.

Claim 32 defines, in an optical assembly comprising a light source and a photonic crystal fibre, wherein the crystal fibre comprises a region of substantially uniform, lower refractive index; said lower refractive index region substantially surrounded by cladding which includes non-coaxial regions of higher refractive index having an air filling fraction of more than 30% by volume of the cladding and which is substantially periodic, the improvement comprising that said lower refractive index region has a longest transverse dimension which is sufficiently long to provide that the light emitted from the light source is substantially confined in the lower refractive index region. Applicants submit that this combination, which includes non-coaxial regions of higher refractive index having an air filling fraction of more than 30% by volume of the cladding, is not taught or suggested by the cited prior art.

Claim 33 defines a preform for a photonic crystal fibre, the preform comprising a stack of canes and a cavity in the stack, and said preform having a transverse cross-section through said cavity wherein said cavity has a transverse dimension greater than a corresponding dimension of any of the canes. Applicants submit that this combination is not taught or suggested by the cited prior art. Claims 34 – 40 depend from claim 33, and are thus also patentable.

Claim 41 defines a photonic crystal fibre comprising a stack of canes and a cavity in the stack, said fibre having a transverse cross-section through said cavity wherein said cavity has a transverse dimension greater than a corresponding dimension of any of the canes. Applicants submit that this combination is also not taught or suggested by the cited prior art. Claims 42 – 48 depend from claim 41, and are thus also patentable.

In view of the foregoing amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw the outstanding rejections. In the event that there are any questions concerning this response, or the application in general, the Examiner is encouraged to telephone the undersigned in order to expedite prosecution of the application.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

Date: March 8, 2005

By: William C. Rowland  
William C. Rowland  
Registration No. 30,888

P.O. Box 1404  
Alexandria, Virginia 22313-1404  
(703) 836-6620